January 29, 1943

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Victory Labor-Management Production Committees of Butte, Anaconda and Great Falls

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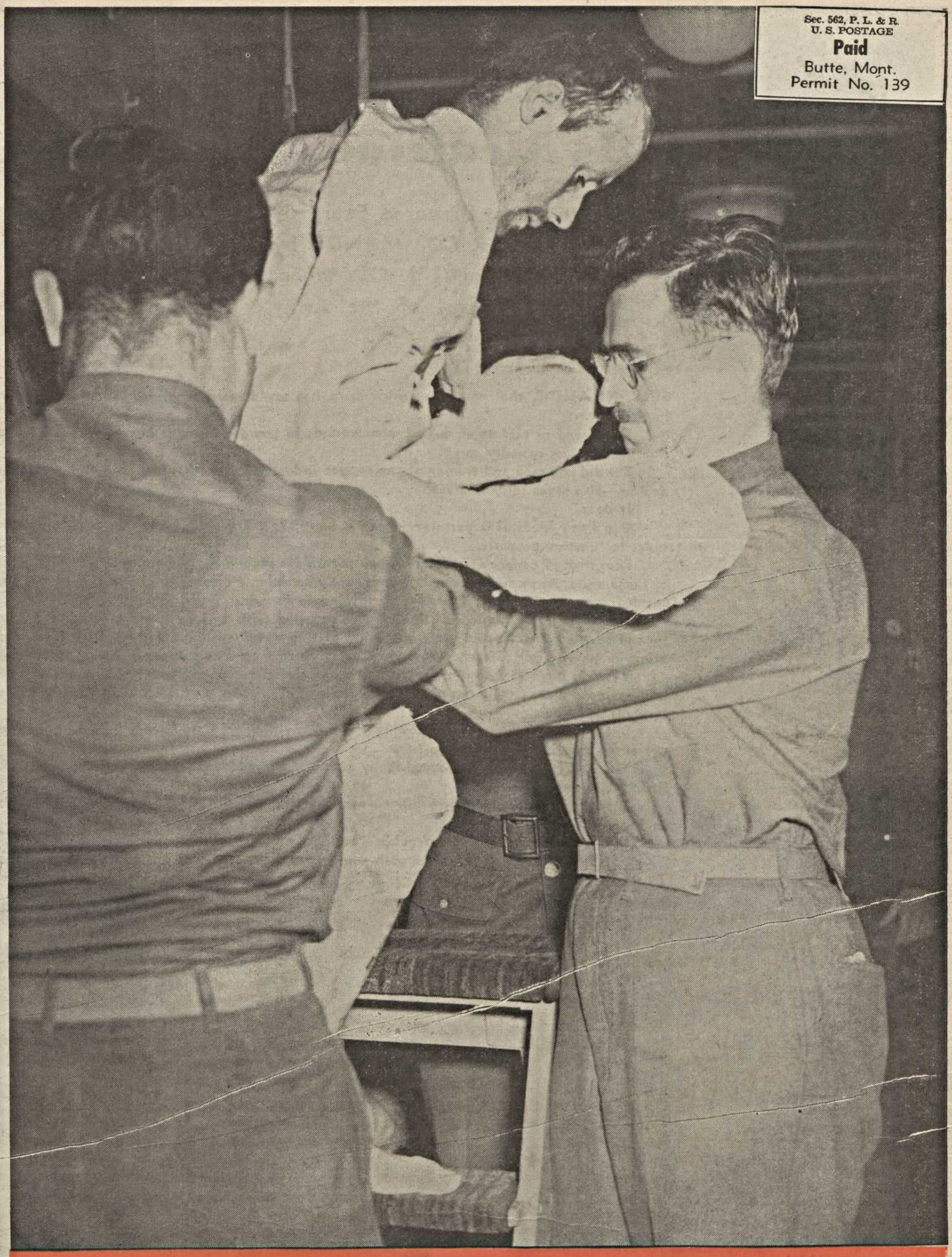

Copper Commando

January 29, 1943

COPPER Is Medicine

A Statement Prepared Expressly For COPPER COMMANDO by Major General J. C. Magee, Surgeon General of the Army

SULFANILAMIDE, that wonder-working drug, has saved many wounded American soldiers in this war.

Swallowed in tablets or dusted over wounds in powder form, it has warded off infection in countless casualty cases.

But did you men and women of the copper industry know that copper—the stuff you deal in—also saves soldiers' lives?

It does.

The Army Medical Department needs at least 375,000 pounds of copper every month in order to function properly.

Four tons of copper are required each month for mobile X-ray field units. With the aid of these units, Army surgeons swiftly and surely locate and extract the bullets, shrapnel and bomb fragments that have imbedded themselves in American flesh.

To keep the Army Medical Department supplied with syringe needles requires twelve tons of copper a month, and great quantities of this metal you mine and smelt go into operating lamps and portable anesthesia apparatus, microscopes and water distilling systems.

Yes, it's important that you men and women of the copper industry know our aircraft builders need more than a ton of copper for every P-38 fighter plane that takes the air against the Japs and Nazis.

But it's important, too, to know that the Army Medical Corps needs half a ton of copper every month just for oxygen tents.

Those oxygen tents have saved many a sick or wounded soldier from a grave beneath a little white cross.

Maybe your own son—or brother—owes his life to one of those tents at a field hospital in Australia or in Africa.

Without copper, that tent wouldn't be there.

This is just a thought to carry with you as you fight this war on the Montana copper front.

OUR story this month on the concentrators on pages 10 and 11 brings you up to the flotation machines or Agitairs. In the picture at the right you see Merle Stone, apprentice to Ernest Leeper, adjusting one of the Agitairs, and below you see a close-up of the froth which rises to the surface of the Agitairs, impelled by compressed air. The copper is in those bubbles and after it is floated off into concentrate it is dewatered and sent to the Smelter. Read the picture story on pages 10 and 11.

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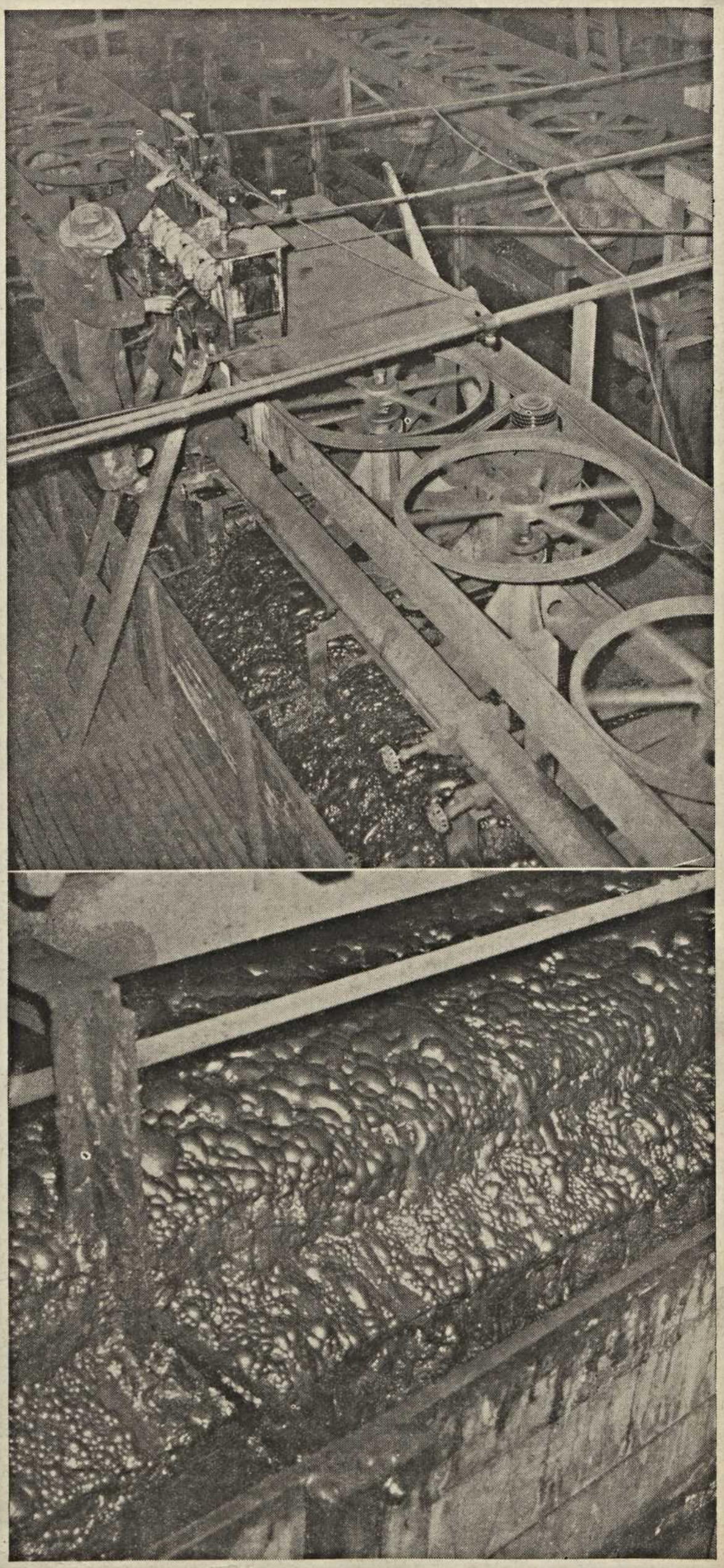
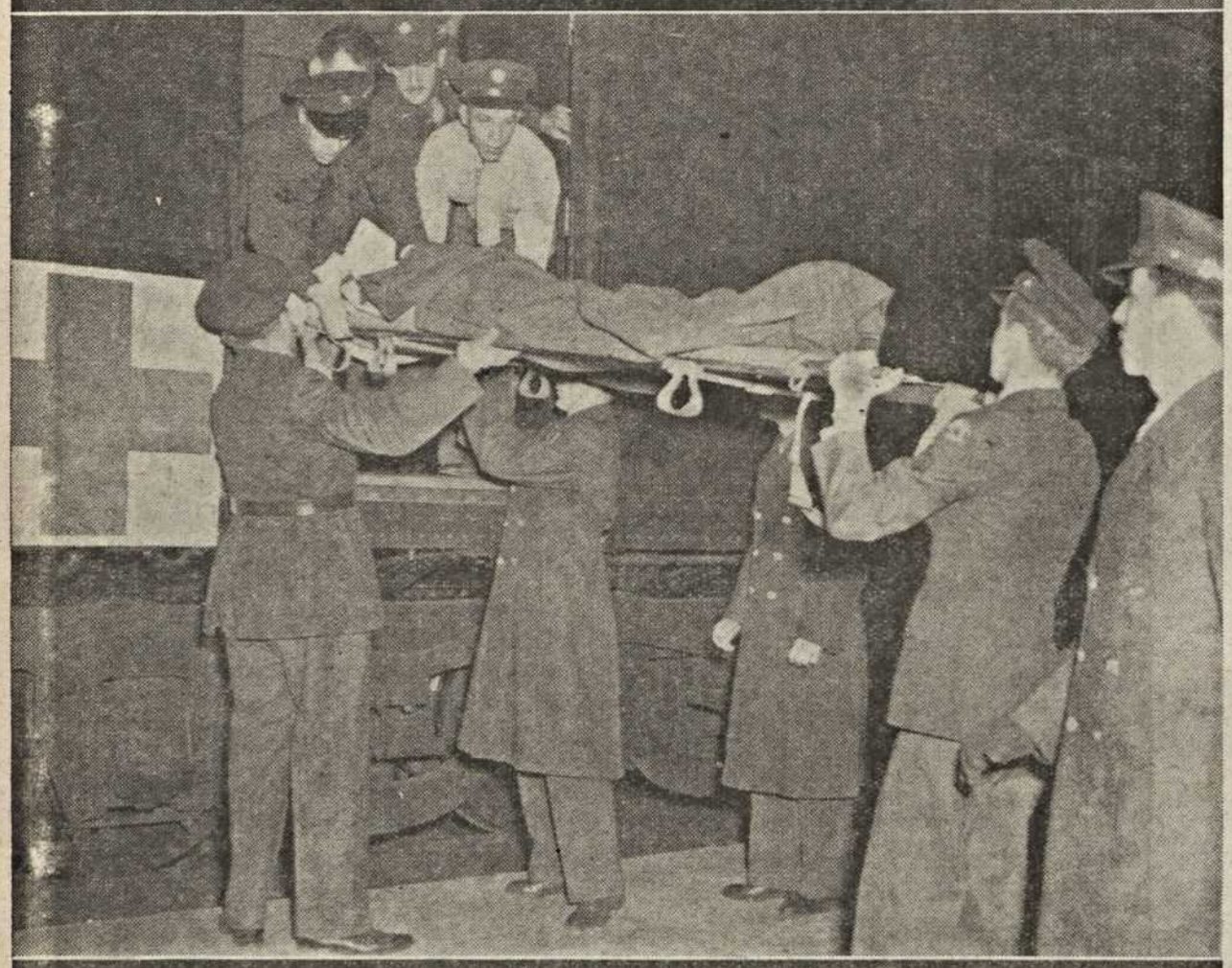


COPPER COMMANDO is the official newspaper of the Victory Labor-Management Production Committees of the Anaconda Copper Mining Company at Butte, Anaconda and Great Falls, Montana. It is issued every two weeks. . . . COPPER COMMANDO is headed by a joint committee from Labor and Management; its policies are shaped by both sides and are dictated by neither. . . . COPPER COMMANDO was established at the recommendation of the War Department with the concurrence of the War Production Board. Its editor is Bob Newcomb; its associate editor is Marg Sammons; its safety editor is John L. Boardman; its chief photographer is Bob Nesmith; its staff photographer is Les Bishop. . . . Its Editorial Board consists of: Dennis McCarthy, CIO, John F. Bird, AFL, Ed Renouard, ACM, from Butte; Dan Byrne, CIO, Joe Marick, AFL, C. A. Lemmon, ACM, from Anaconda; Jack Clark, CIO, Herb Donaldson, AFL, and E. S. Bardwell, ACM, from Great Falls. . . . COPPER COMMANDO is mailed to the home of every employee of ACM in the three locations—if you are not receiving your copy advise COPPER COMMANDO at 112 Hamilton Street, Butte, or, better still, drop in and tell us. This is volume I, No. 12.



The Wounded Return

STORIES of curious Arabs who stood around the battlefields watching the action with complete disregard of gunfire, of enemy planes strafing troops on beaches and roads, of Frenchmen who opened their hearts after fighting like tigers, of long marches and of blazing action are being told by wounded United States soldiers who have returned to this country from the combat zone in North Africa.

The War Department, in releasing interviews with a few of the 115 officers and men returned from North Africa who are under medical treatment at the Walter Reed General Hospital in Washington, D. C., said that those selected for the interviews were men whose stories were typical of those of the entire group. Interviews were confined to a few of the men whose conditions best permitted their being interviewed.

Without exception, the men were high in their praise of the Navy, whose co-operation made the campaign possible.

Second Lieutenant Leslie Ward Dooley of Athens, Tennessee, an infantry officer assigned to an anti-tank company, said:

"On Sunday, November 8, my outfit went ashore in troop landing boats. Three battalions had preceded my company and as I waded through water up to my neck to the beach there was no gunfire. A bunch of Arabs greeted us, but all they could say was 'seegarettes.'

We went inland about two miles before running into enemy fire. One of my truck drivers reported to me that one of our 37-millimeter guns had been isolated in a forward position. They needed help, badly.

"Taking my sergeant and a driver," Lieutenant Dooley continued, "I went forward in a weapon carrier to aid this gun and its crew. When we were about 100 yards from the gun, the enemy spotted us and started spraying the truck with machine gun fire. The bullets

splashed on our windshield and we jumped out. While we were crawling to the gun position we heard a loud roar. Looking back we saw that our truck had caught fire and exploded.

"We managed to get to the gun position and spotted a French tank on a hill. We let go with a round. We got that tank, but another appeared. We got that one, too. About that time three or four more tanks came over the hill and then some more. There must have been about a dozen of 'em, coming at us from all directions with their machine guns and 20-millimeter guns blazing away . . .

"They took us to a hospital, where a French doctor who could speak some English operated on me," Lieutenant Dooley went on. "French Boy Scouts brought me chocolates, tangerines and oranges. They didn't have much food. The doctor apologized for that. There isn't much anywhere, he said. We had two meals that day with lots of goat meat, but they must have forgotten to skin the goats. Once they gave us sardines.

"Four days later the French took us to another town, and delivered us to our troops. We stayed in this town for one day and then were taken to another place where we boarded a ship for home. I had been in Africa exactly one week."

Private Robert McNutt of St. Louis, Missouri, was a member of the first party to land near Casablanca. After scrambling through the surf, his group pushed on, under the fire of snipers hidden in the fields. After marching inland all day, his party dug in, under shell and machine gun fire.

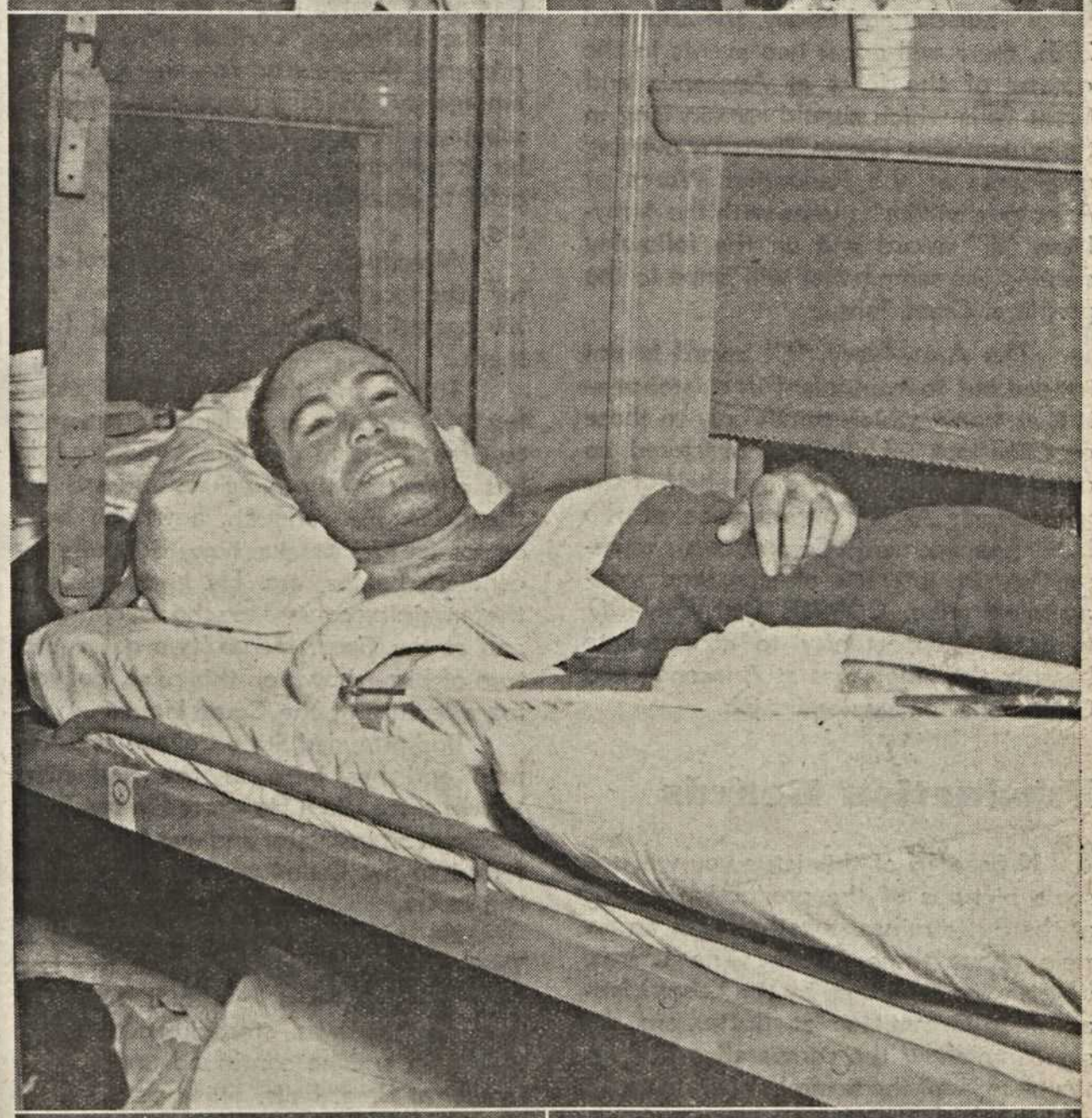
"Three of the boys knocked out two, maybe three, machine guns. We snuck up to within thirty yards of the machine guns, and then let 'em have it with hand grenades," Private McNutt related.

It took further questioning to elicit from Private McNutt the fact that he himself was one of the group that silenced the machine gun nests. After this episode, he was shot in the chest by a sniper.

Private Nicholas Lastokein of Fredericksburg, Ohio, who was hit in the leg by shrapnel while leading a squad over a hill near Casablanca, was glum over being separated from his buddies, and eager to know when he could be back with them again.

There are other reports from other fighting men, back from North Africa to recover from their wounds. In general the spirit of the men is excellent, although they have been through a harrowing time. Most are eager to get back into the fight, because they know that unless they give their best efforts the cause of the United Nations may well be lost.

They don't go for the idea that we now have Germany and Japan on the run and that it is only a matter of a few weeks before we are at peace with the world again. These boys know, and nobody knows better than they do, that we are pitted against strong, ruthless foes who will fight to the last ditch.



COPPER Commando

The Official Newspaper of the Victory Labor-Management Production Committees at Butte, Anaconda and Great Falls

Hats Off!

ON Thursday and Friday, the 28th and 29th, there will occur two events in the careers of the folks at Anaconda and Great Falls which should remain long in their memories. For on Thursday evening employees at the Reduction Works at Anaconda will be honored with the Army-Navy "E" award and on the following evening the same honor will come to the people at Great Falls.

The Army-Navy "E" award is not handed out to every plant in existence—it is an honor which comes only to those organizations which have registered an outstanding performance in behalf of the war effort. As the mouthpiece of the Labor-Management Committees, representing the interests of labor and management alike, COPPER COMMANDO takes this opportunity to congratulate heartily the employees at Anaconda and Great Falls for a splendid job.

Production Boards

ON page 16 of this issue you will see some pictures of the production boards at the Butte mines, together with an article about these boards. The boards, which were sponsored by the Labor-Management Committee at Butte, are designed to show the comparative production records of the several mines, in terms of percentages of their quotas.

These are big words and what do they mean? Well, if the Badger led last month (as it did) with a 120 percentage, it means that the Badger has produced 120 per cent of the calculated production of that mine. Each mine has a quota which is determined by figuring the estimated tonnage per month of that mine. The Belmont came second, for example, with 99 per cent because it produced within one per cent of its quota. The Mountain Con came in third with 97 per cent.

Make it a habit to look at your production board regularly—it will let you know how your mine is coming along in competition with the other mines and let's hope that, next month, it will be your mine car which will dump its load first on the heads of Hitler, Mussolini and Hirohito.

Bud Is On the Job

AL FRENCH believes that, if this war is to be won, civilians have got to do more than talk about it. And Al—most people know him as Bud—practices what he preaches. This Great Falls patriot spends his working day in war production and at least five out of seven of his working nights aiding the war cause on his own time.

Right now Bud is busy as Commander for the Citizen's Defense Corps for Cascade County. This is the local branch of the Office of Civilian Defense. He prepares the county for air raids and emergency services in case of air raids or sabotage. In case of fire caused by a raid, he is prepared to confer with the fire chief to agree on equipment and procedure.

Already he has set up a control center (the location of it is kept secret) and all operations would be directed from there.

This is only the start of it: Following OCD training at Helena, he returned to Great Falls to get things moving. He has charge of the Speakers' Bureau for the OCD. He conducts a fifteen hour course on gas attacks, how to handle incendiary bombs, etc. He gives talks at these training courses in schools, churches and at the Court House (we got a picture of him, shown on this page, delivering a lecture at the Court House).

Bud attended State College at Bozeman and has been at the Reduction Works since 1934. He started in the Tank House as an inspector and was later transferred to the Cadmium Plant, where he is a caster.

He is the registered Scoutmaster of Troop No. 6 and in addition to this is a First Aid Red Cross instructor. His First Aid training was started under Walt Needham and he continued under Dave Lawlor at Great Falls. This was a Bureau of Mines First Aid Training Program and he was given an instructor's rating for the American Red Cross.

His work as Commander for the Citizen's Defense Corps he finds most interesting. His knowledge of defense

combat methods is thorough and he speaks to his listeners with calm assurance. The night we listened to him at the Court House he explained in detail various methods of combatting attacks, and was able to answer a variety of questions. One of his listeners remarked to us after the session was over: "That man French certainly knows his stuff!"

General procedure which Al follows is to organize the community first; after a group is formed the course of instruction is given and OCD certificates granted to those who pass the course. Each qualified registrant is then assigned to a job. There are about two men to each woman registered in these projects.

We got a picture of Al at the Cadmium Plant (he was supposed to be wearing goggles, as we all know, but the reflection from the glasses "kicked back" into the camera, so we had to ask him to take them off for the sake of the picture). When he came off shift, we got to chinning with him. We asked him whether his working five and sometimes more nights a week didn't upset his home life, and he laughingly told us that although his wife thought he overdid it, she was certain that it was part of a necessary program. Bud's wife was formerly Dorothea Brown of Great Falls and they have two youngsters—a boy four and a daughter not quite two.

Bud is not an easy man to interview—he's a modest guy and you practically have to wrench the facts out of him. He strikes us as one of those fellows who goes quietly about doing everything he can to win the war.

How the Land Lies

Before you can mine the ore, you must know where it is. It is the vast and important job of the Mining Engineering Department to make surveys, so that exact locations can be determined. These surveys help protect the miners, too, and in other ways are essential to good, efficient and safe mining operations

THE stars are to the sea captain what Big Butte is to the surveyor. For on the highest point of Big Butte the United States has established one of the many triangulation points which cover the country. This point is 6315 feet above sea level and has a definite latitude and longitude so that it can be placed on any map, large or small, which is made of this region.

It is the daddy of all the family of surveys and maps which are used in Butte mining today. For the past fifty years it has been used together with other local triangulation points in locating the four thousand or more mining claims patented in the Butte district, all of which are shown on the maps in the Mining Engineering Department.

That's the triangulation point of Big Butte shown in the picture at the lower right with Dave Piper and Gus McLeod surveying the "Richest Hill on Earth." The six-inch steel pipe marks the point and it is set in concrete for permanence.

Let's go around with the engineers and see just how they do their work and why it is so very important. In this issue we'll go underground and get the notes and maps and in a later issue we'll go into the office to which all notes and maps are taken, and see how they are transferred to the permanent records of the Mining Engineering office.

These underground surveys do a great deal toward providing protection for the workers. It's mighty important to know where men are working on the level above when blasting in workings from the level below. Too, errors in mining are costly. First, in order to make maps of the underground levels in the mines, so that they will be properly related to Big Butte and each other, the engineer must plumb the shaft. When the shafts are sunk, they are made vertical by "plumb" lines of cord. But the job of the engineer is to carry bearings and positions down these vertical shafts to be transferred to underground surveys. Two fine copper wires are suspended in the shaft with heavy weights attached hanging in water and oil. The bearing between the wires is put on above and taken off below by the surveyors' transit or surveying instrument. From these short bases underground surveys are carried to all the workings so that maps may be made of them.

At the top of page 8 you see Fred Strandberg "setting up" under a survey station as a preliminary to picking up the progress in this drift. As an example we'll say that this drift of ore advanced one hundred feet during the month and it must be "picked up" so it can be shown on the maps. A sketch of the drift is made right then and there with the top of the page always northerly, and they have the scale named in the scale drawing.

Brass survey station tags are used in numerical order underground. (That's for identification purposes both in the

mine and in the office calculations, ledgers and maps). The stations and points are described in written notes which are later copied into a ledger. It is important that the plan outline of the excavation be accurate and timber and ground relations correct. The exact shape of the excavation may explain a geologic feature and affect future development.

Correct timber is necessary to provide a basis for stope platting. (Stope platting is the process of transferring field notes and surveys to the permanent maps, in which there is a new sheet or map for each eight-foot interval of elevation). Usually a sketch is made showing the timber, and the chutes and manways are located in the sketch. Also, the surveyor must determine the grade of the regular cross-cuts and drifts, and a report be made of the condition of the grades.

Another important duty of the engineer is to keep workings running so they will hole other workings on line and grade. Below Engineer Fred Annala and his assistant, Henry Johnson, are shown setting lines for the use of the miners in running a straight cross-cut. At the lower right on page 9 the miners, Joe Darrow and Clarence Craig, are "sighting over the lines" and marking the breast for drilling, so they will drill in just the right place. For, through the solid rock approaching the miners in a certain cross-cut, another crew is driving ahead on lines set in the same way. With safety and accuracy at stake the engineer is on the spot if the holing is not well made.

In timbered drifts survey stations are nailed to the timber, usually on the side of the cap opposite the working face. Because timber moves with blasting and ground weight, it is necessary to resurvey workings from known accurate points. These resurveys are made after advances of five or six hundred feet, or at any time when it is evident from raise holings that the survey is in error (a holing of a raise is an opening to the level above and serves as a check on the survey relations between levels). In the office, duplicate calculations are made by the engineer and his assistant of all underground or surface surveys and with these and the sketches made while surveying, the permanent maps are constructed.

Another big job well done by the Mining Engineering Department is the measurement of the contracts. The contracts are verbal and apply for one week or to the end of the contract week in which they are started. For the purpose of accomplishing measurements, calculations, and clerical work in a limited time, the mines have been divided into two groups. In one group the contract week closes with the night shift on Monday and in the other group on Tuesday. The measuring is done on the following day in each group. The crew at each mine consists of the head engineer as boss, his assistant engineers and the mine samplers. Each measureman is accompanied by a shift boss because he can call attention to such items as retimbering and other jobs which have been done but might not be noticed in the absence of the miners who had worked on it.

Measurements are based on the fact that the survey of any area being mined is shown on the sketch and it gives the outline of the total excavation at any

measure date. The area included between the outline of the previous measurement, which is always inked, and the present measurement, shown in pencil, is the area of the excavation for the current week's period, which when multiplied by the height or thickness gives the cubic excavation.

Assistant Engineer Bob Gale is measuring a rill stope contract with tape and "rillometer" in the lower left picture. A rillometer is a home-made gadget combining a protractor (we looked it up and it's a mathematical instrument for laying down angles on paper) and sleeve for tape. The measureman uses it to get the slope of a rill cut for sketching purposes.

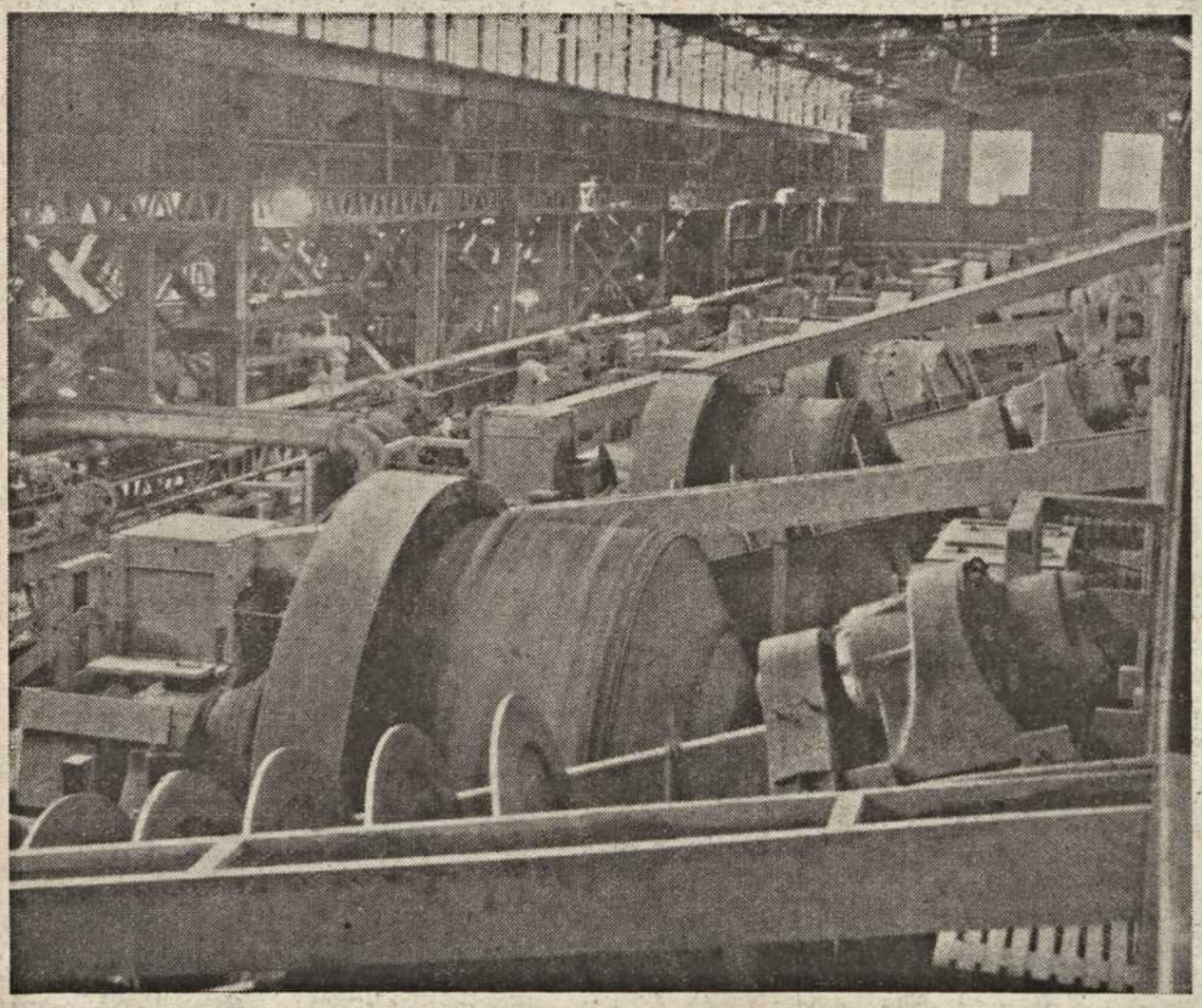
In the upper picture to the right Bob Gale is measuring a flat back stull stope contract; the miners Larry Waymire and George Zigich are assisting the engineer to measure length and width of cut.

During the afternoon of measure day, the measuremen calculate the contracts on triplicate prepared sheets furnished by the timekeeper and clerks. These sheets show the contract number, place number, unit prices, and number of shifts. All of these finished calculations are checked to see that the prices are right by the foremen and assistant foremen and then sent to the timekeeper. Results of all the contracts are posted on the bulletin board at the Mine Office as soon as possible so that the men coming off shift may see the earnings for the week. Errors are occasionally discovered by remeasurement or recaluculation, when miners request such checks, or through the regular checking by the engineers in the office the following day. Underpay and overpay contracts develop from these investigations. However, they represent less than two per cent of all of the places measured.

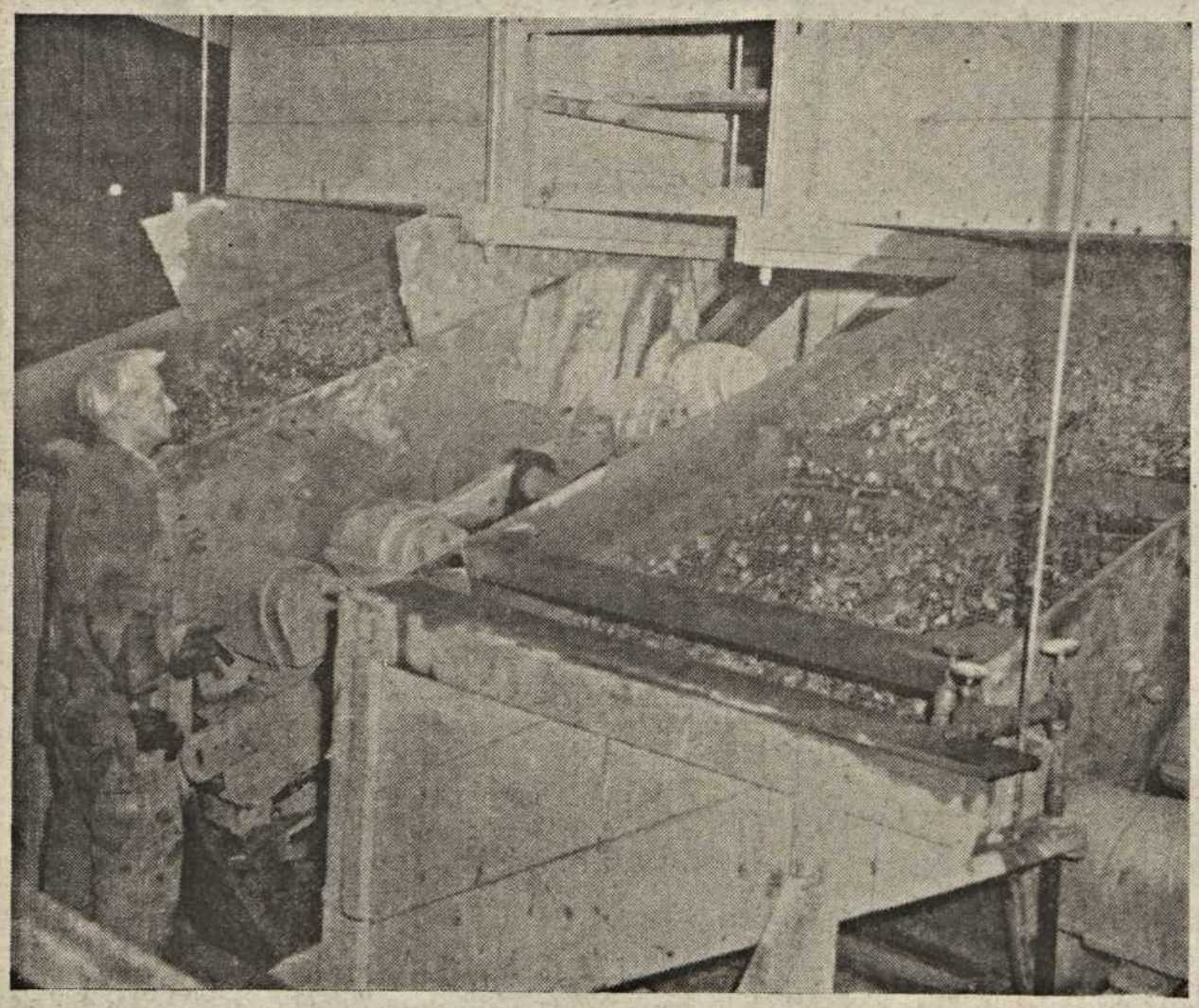
Eventually the reports of all underground and outside work are brought into the Engineering Office where everything is checked for accuracy. The correct monthly distribution of money, cubic feet, tons, and progress is dependent on the accuracy of the records which go to make up these reports. We'll show you the boys in the Office transferring these underground notes and sketches later on. The office operations are not only most essential but they're mighty interesting as well, and we think we have a good picture story for you.

Fine Stuff

Fine stuff is what the ore is when it comes out of the concentrators at Anaconda. Last issue we left the ore at the crushed ore bins—now we follow it on through the screens, rollers, classifiers, mills and to the flotation machines. Come on and join us and see how it is done!



VIEW of the East Mill showing Ball Mills. Circular discs in foreground are on the Classifier



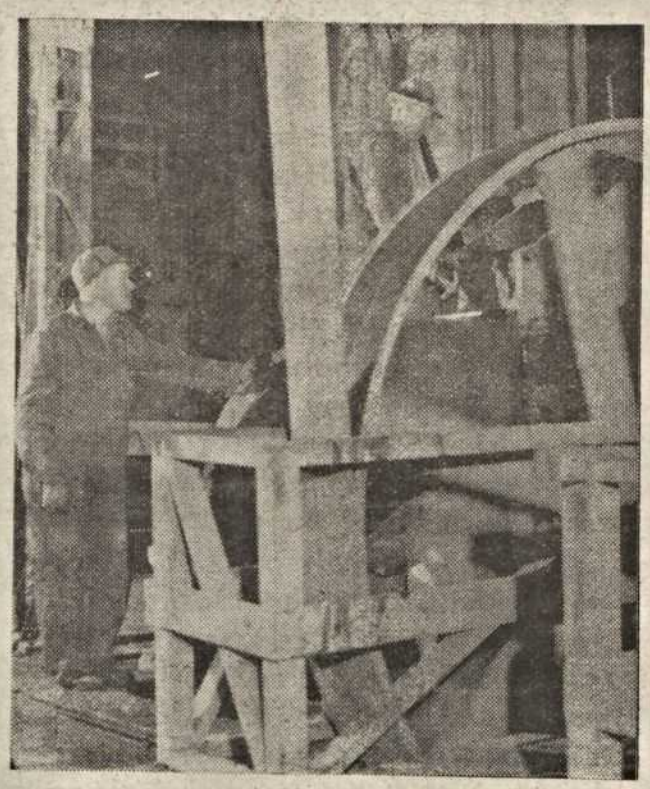
HERE'S a Tyler Ty-rock screen. The oversize ore goes to the crushing rollers for concentration

IN the concentrators, the crushed ore goes through more pulverizing processes —it's got to get down almost to powder form, don't forget.

Last issue we left our ore in the crushed ore bins at Anaconda. Now we're ready to push it along. The crushed ore goes into feeders under the bins, from which bucket elevators lift it upon vibrating screens—that's a Tyler Ty-rock screen just above. The mesh screen has been replaced by a 7/8-inch punched round-hole plate screen which was adopted by the Anaconda Labor-Management Committee upon the suggestion of Joe Antonich, repairman in the Upper Mill.

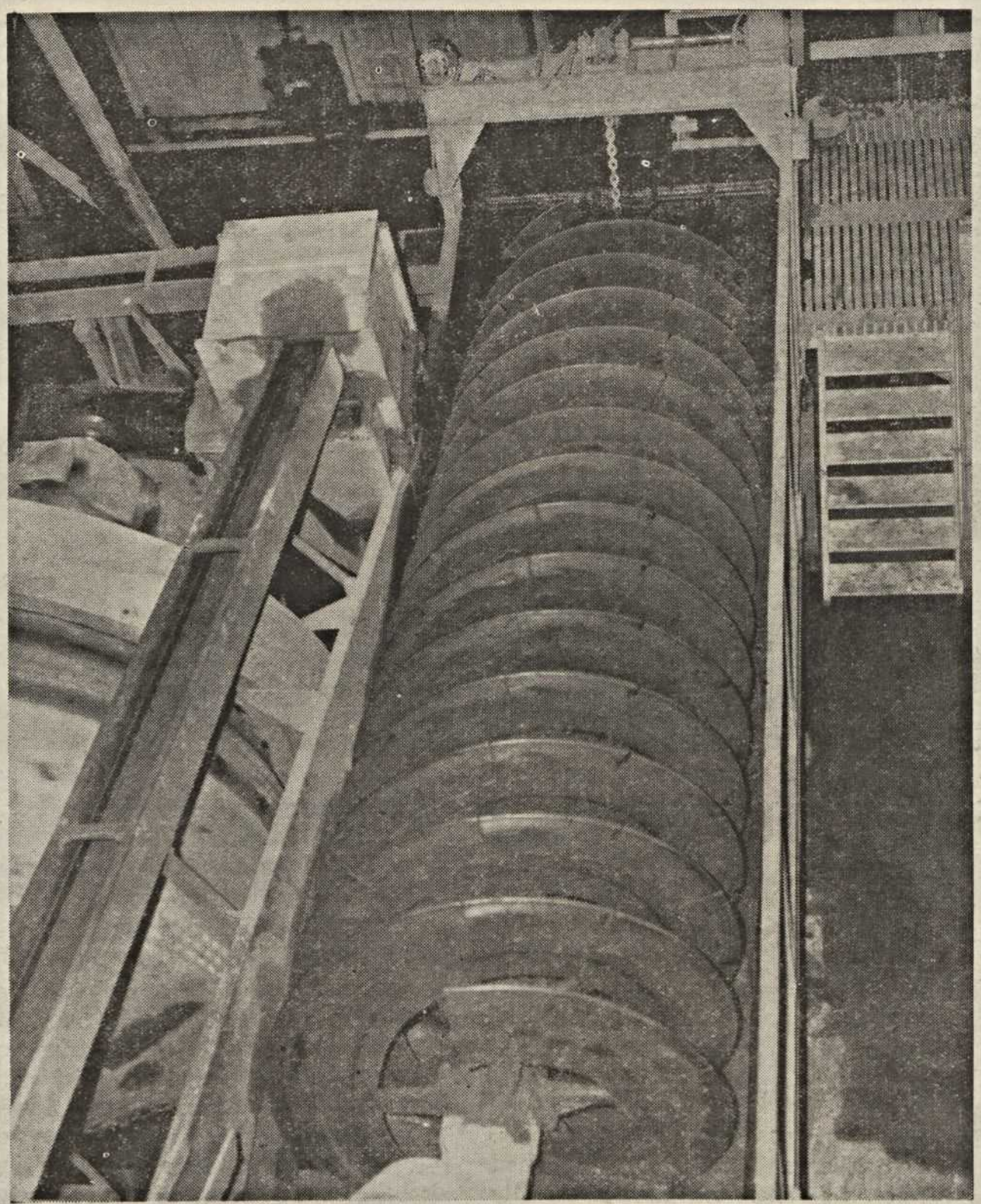
Oversize ore goes through two sets of crushing rolls to grind it further, so it will pass through the screen next time. At the right above you see crushing rolls through the wheel—the oversize is coming into the rolls from the screens above. William Ehlafald, repairman for the East Mill, is the man at the top, and Earl Draper, feeder, is below him.

The undersize ore proceeds to the Akins Classifiers—that's a classifier on the opposite page at the upper left. It sorts the ore also, with the overflow passing off at the bottom and the bulkier ore being discharged into the Hardinge Mills, where it is pulverized and then re-routed through the classifier.



OVERSIZE ore goes into these rollers. The ore must be fine enough to pass through the screen

CLOSE-UP of a Hardinge Mill, with Arnald Beckman, millman. There are twenty Hardinge Mills



MAKING the daily charge of grinding balls. The balls are pulverized at the end of the day, and new balls are needed to grind down the ore. A mill needs also to be relined from time to time; in the picture below a re-lined mill is being re-charged. Many of these grinding balls come direct from the Foundry at Anaconda—we wrote up how grinding balls are made a few issues ago.

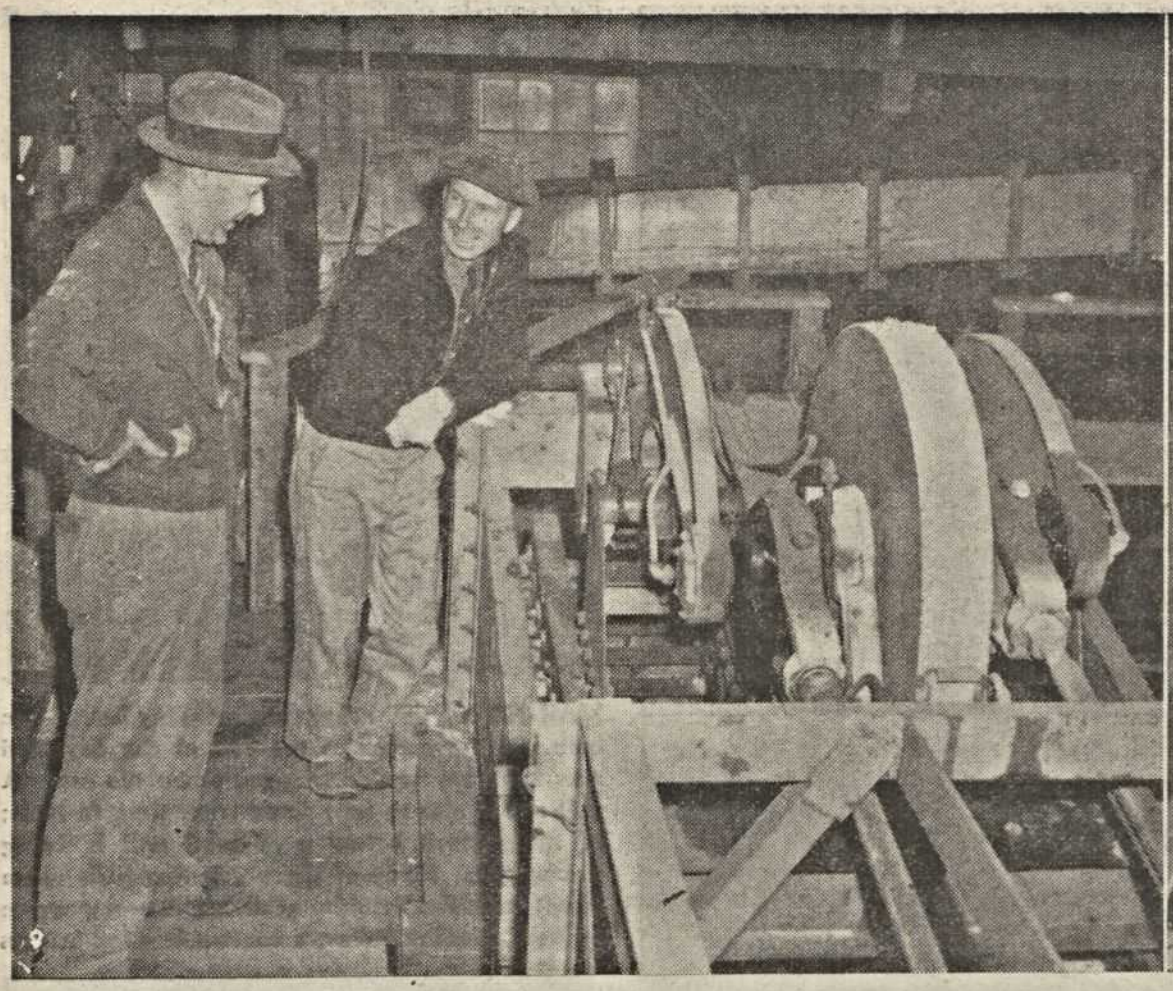
CLASSIFIER, taken from above, is shown at the top left. This spiral rotates, pushing the bulkier ore to the top, while the overflow goes out at the bottom; part of Hardinge Mill is shown at the left. In large picture below, B. C. Grandy is taking a density of the classifier overflow. He stands at the lower end of classifier.

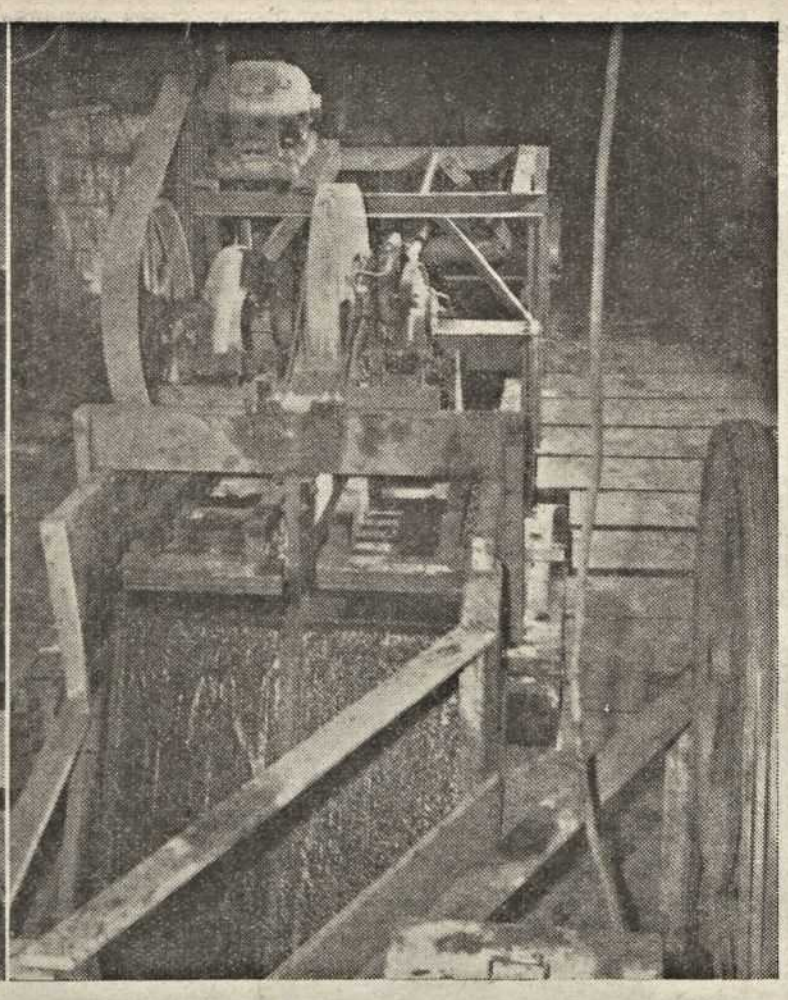
The picture at the lower right on the opposite page shows you what a Hardinge Mill looks like—Arnald Beckman, millman, is standing in front of it. The changes created in the East Ball Mill which we have discussed in earlier issues are now completed—without the loss of a minute of production time; there are twenty mills, all told, in the East Mill. Sixteen of them operate, four are always "down" for repair, so that those that are operating do so at the highest efficiency.

Mills are "charged" daily—that is, the steel grinding balls are put into the mill for grinding up the ore. At the top, right, you can see the daily charge being made. Below, Tom Barry is returning the charge to the mill after it has been relined.

Testing the density of the classifier overflow is most important, and at the lower right we see B. C. Grandy taking such a density. This test reflects the copper content of the overflow. (We took a picture too of D. S. McCarthy, foreman, and repairmen M. J. Buckley, Fred Gardipee and Sid and Roy Allen but the darned thing didn't come out—there must have been a moth on the lens).

The overflow goes on, then, to the Agitairs or flotation machines (look on page three and see pictures of the Agitair and of the froth it creates). Out of the Agitairs comes a concentrate which, when dewatered, goes to the Smelter. The remainder is tailings, a waste product which is taken to the tailings dump.





News Notes on Zinc

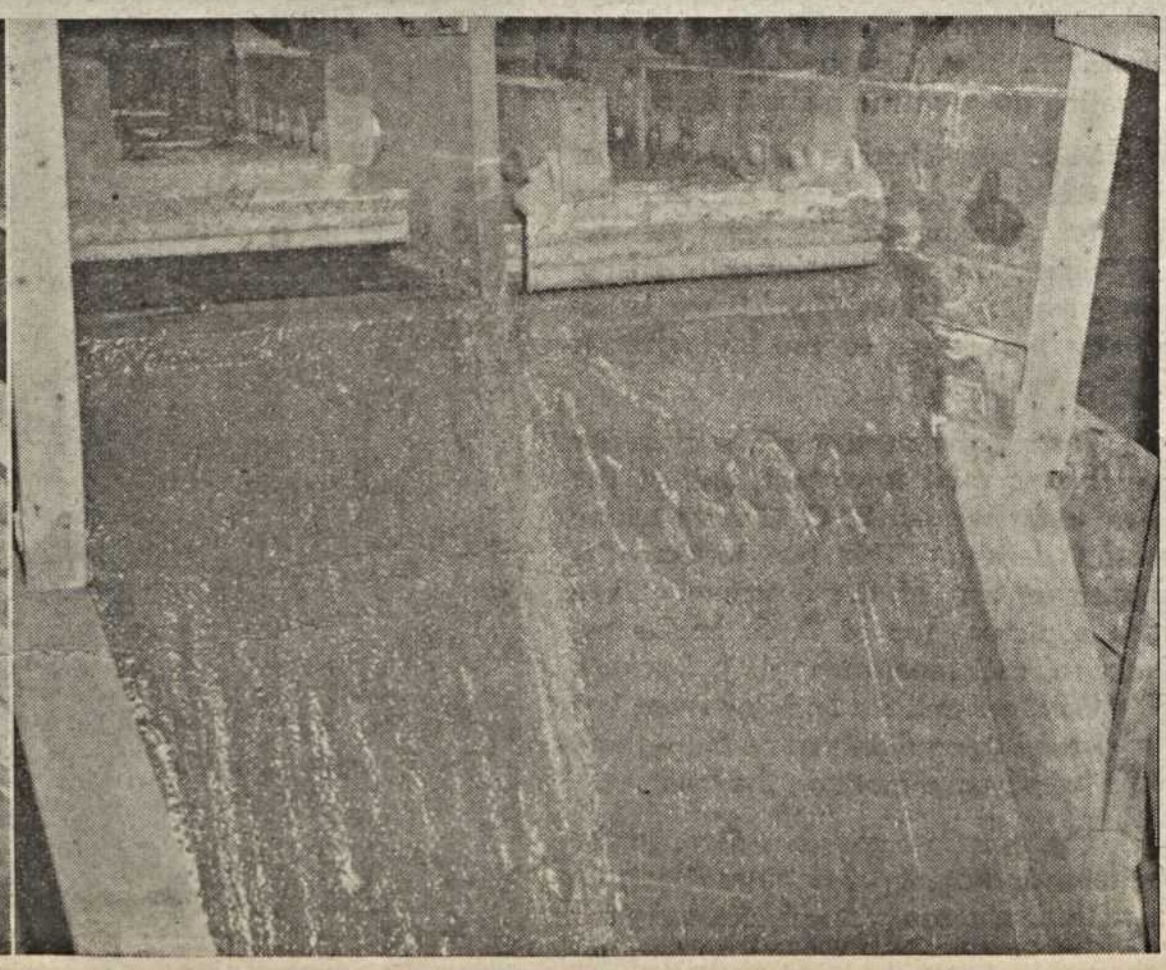
IN a previous issue we went to the Zinc Leaching Plant on a hurried trip and saw the first main cycle in zinc leaching. There are three other cycles, however. These steps save a large amount of zinc which might otherwise be lost.

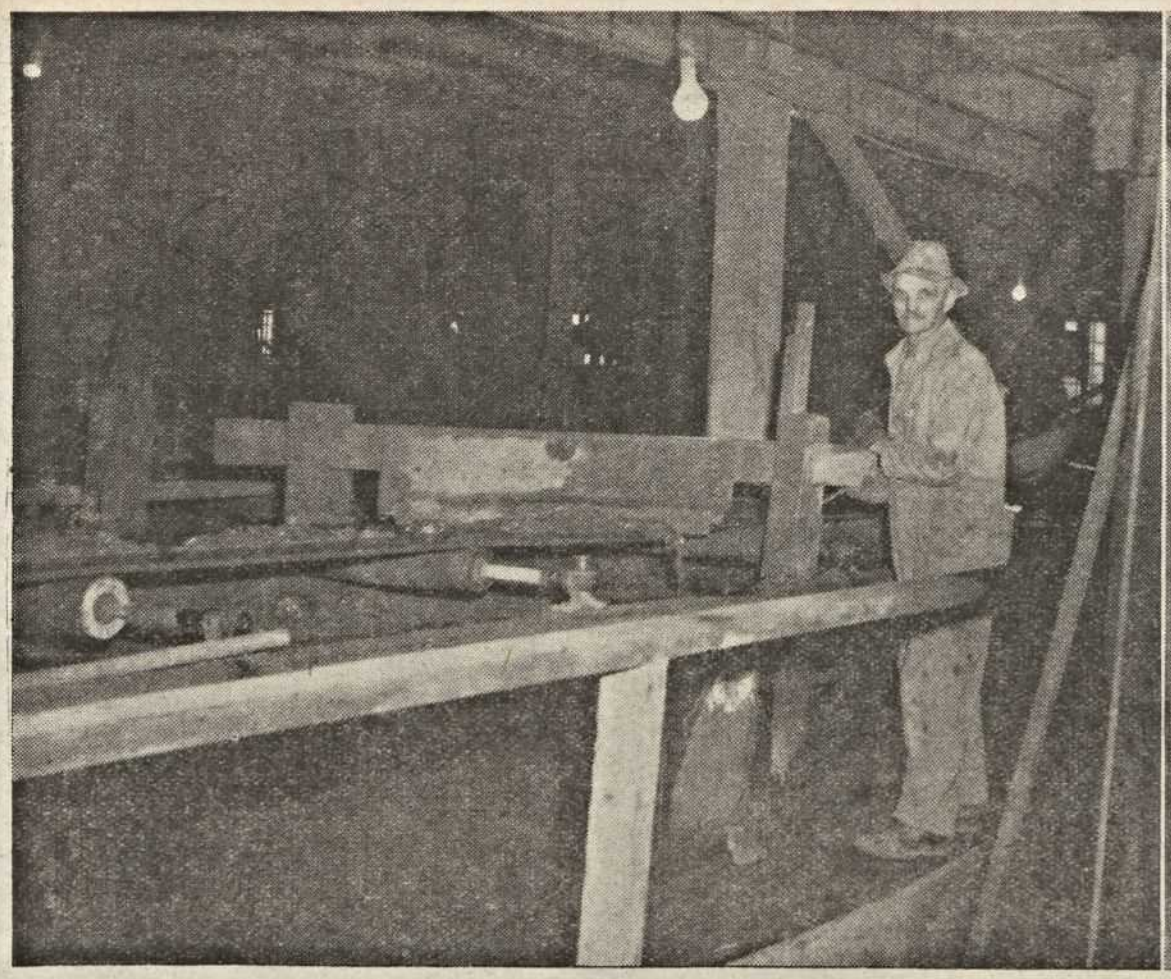
You remember that the Neutral Leach Discharge was settled in Dorr thickeners in order to separate the solids from the solution. We told you how the solution was treated but left you wondering about what happened to the solids.

These solids, along with some sandy materials previously extracted from the Neutral Leach Discharge, make up the feed to the second main, or Acid Leach, cycle. In the upper left snap, H. W. Lindner and C. C. Spohn, the two fellows who are responsible for operating the Leaching Plant, are watching the operation of a newly installed classifier. This classifier is at work separating the sandy material from the Neutral Leach Discharge. You can see just what the sandy material looks like before it is sent to the Acid Leach in the upper and lower right views.

The solids from the Dorr thickeners, which make up the main bulk of the feed to the Acid Leach, are pumped directly into the first of a series of eight Pachuca tanks. There the solids meet with return acid from the Electrolyzing Department and more zinc is dissolved. The discharge from the Acid Leach is settled in another set of Dorr thickeners to separate the solution and solids. That's Ed Farrell, shift foreman, looking down at one of the Acid Dorrs in the lower left picture. The clear solution from these Acid Dorr thickeners (it doesn't look clear to us) is sent to the head end of the first main cycle where it joins the regular flow.

The solids settled in the Acid Dorrs still contain enough zinc to make further treatment profitable. These solids are removed from the bottom of the thickeners and carried to revolving, drum-type, Oliver filters. There all excess solution is removed from the solids and the resulting cake is carried by means of conveyor belts to the beginning of the third main cycle —the Residue Leach. Eighteen mechanically-agitated leach tanks are used in this operation. The cake is carried to each tank in turn by the proper placing of scrapers which serve to divert the solids in the right direction. Conrad Jorgenson is adjusting one of these scrapers in the upper right picture on the next page. This scraper is causing the cake on the belt to





slide over the edge and drop directly into one of the Residue Leach tanks.

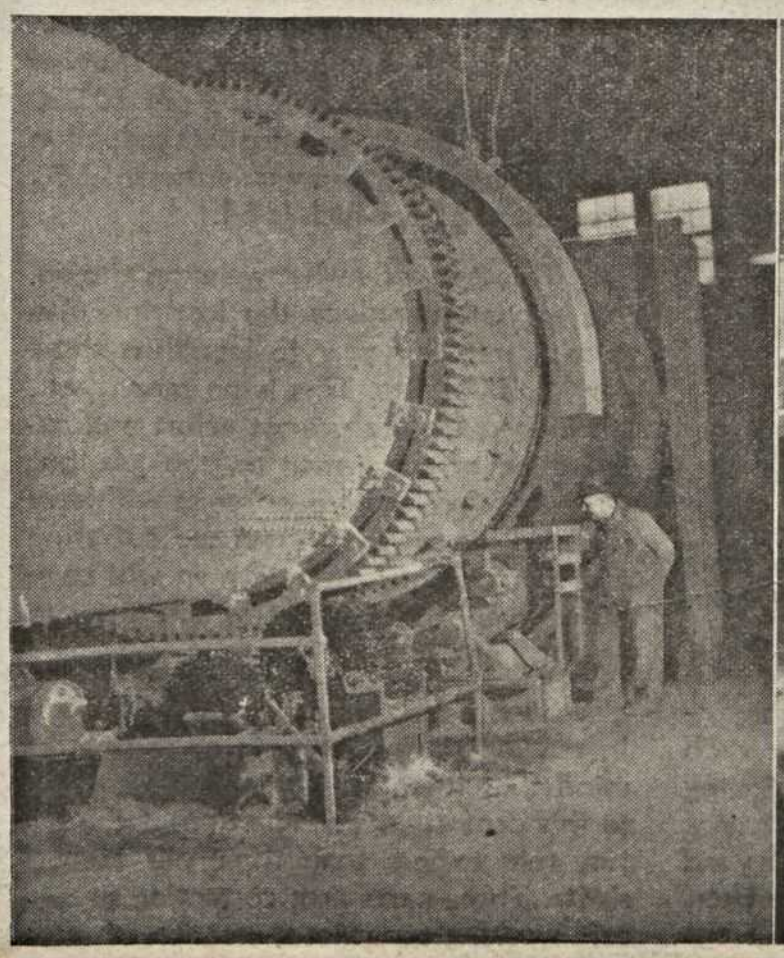
The Residue Leach is a batch operation in that the material in each tank is leached as an individual operation. Higher acid strengths are used in this leach than in the two previous leaching operations because this is the last chance to dissolve zinc from the solids.

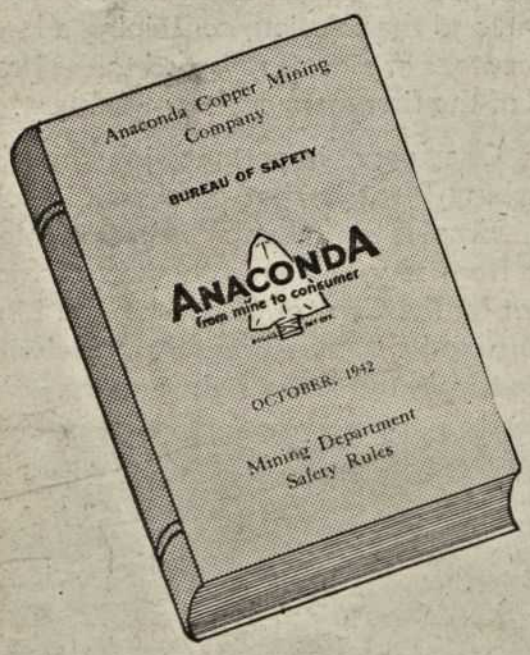
The material when leached is discharged to another set of Dorr thickeners where the solution and solids are separated by settling. The solution is sent to the head end of the first main cycle. The settled solids are further thickened and washed in a leaf-type Moore filter. The material to be filtered is pumped into large concrete tanks and the filter lowered into the tanks. The upper right picture shows John Moy raising a filter.

The thickened solids from the Moore filter are filtered on a set of revolving Oliver filters. The cake from these filters is carried by a conveyor belt to a large rotating drum-type dryer. We see Bob Hood inspecting the supporting rollers of the residue drier in the lower left shot. Here most of the remaining moisture is driven off and the dried residue is dumped into railroad cars to be shipped to the East Helena Plant. There the lead, gold and silver contained in the residue are removed and recovered. The slag resulting from this treatment still contains some zinc. In order to recover this zinc the slag is turned over to the East Helena Slag Treating Plant, where the zinc is recovered as a zinc oxide fume. This fume is returned to Great Falls and enters the Leaching Plant in much the same manner as the original calcine.

Now let's leave this residue and see what happens to the Purification residue from the Shriver filters. In the last issue we told you that the solution from the Purification was filtered to remove the solids from the solution before it was sent to the Electrolyzing Department. These solids, or Purification Residue as it is called, contain a lot of zinc along with a considerable amount of copper and cadmium. The fourth main cycle recovers these valuable metals. The residue is first oxidized by air drying and then leached with return acid from the electrolyzing cells. The solutions and solids are separated by settling in Dorr thickeners. The solids contain a large amount of copper and are filtered and sent to the copper smelter at Anaconda where the copper is recovered. The solution is treated with zinc dust to remove the remaining copper, settled again to clarify the solution and again treated with zinc dust to precipitate the cadmium contained in it. This solution is filtered to remove the impure metallic cadmium. The cadmium is sent to the Cadmium Plant for further treatment, and the solution, containing a large percentage of zinc, is returned to the head end of the first main cycle of the Plant.

One very important job in the Leaching Plant is that of chemical control. Samples are taken at frequent intervals from several points in the Leaching Plant by the Control Chemist. Jim Lind is busy at work measuring a sample with a pipette in the lower right picture.





Safety Record

ACCIDENTAL injury frequency rates are based upon 10,000 shifts for two reasons. First, 10,000 shifts happens to be about a normal lifetime of work in nearly any industry. Thus an accidental injury rate, for example, of ten lost-time injuries per 10,000 shifts means that the men concerned had a chance to be injured ten times in a lifetime of work. Another reason for using 10,000 shifts as a basis for making accidental injury rates is that it is frequently easier to figure by using such numbers as 10, 100, 1,000, 10,000, etc.

With this explanation we give the lost-time injury rates per 10,000 shifts in the Butte mines for each of the past six years:

1937	9.116
1938	7.225
1939	7.096
1940	5.790
1941	5.000
1942	4.578

This is a reduction of 49.78 per cent in 1942 compared with the 1937 rate. Now, what does a reduction of 49.78 in our accident rate mean? In 1937 the estimated loss of time due to accidents, including the standard estimate for each fatality, was 136,891 man-shifts. Saving 49.78 per cent of this by reducing the accident rate means that we saved 68,144.00 shifts which would have been lost by injured men. Now, the average man can work about 300 shifts a year if he works every day available to him. Therefore 227 more men were kept on the job every day during the year because we reduced the accident rate.

How many average steady men, then, laid off even with the lower rate? The estimate is that we lost a total of 151,484 shifts, still, in 1942. This is equivalent to the full time of 504 full-time workers The question now is: How many of these could we keep on the job if we further reduce our accident rate to 3 per 10,000 shifts? This would be a further reduction of 12.63 per cent, and would mean 12.63 per cent of 504, which is 64.

This is exactly what we expect to do. We expect to reduce the lost-time frequency rate this year to less than three per 10,000 shifts. This is no mean task. It will require the utmost effort and cooperation of every man on the job, but when accomplished, every man will have received his reward in reduced suffering and loss, and our fighting men will have been given the support which they so urgently need.

Such a task requires a definite plan. In making such a plan we must bear in mind that there are three distinct parts to this campaign for reduction of the injury rate to less than three per 10,000 shifts. These parts are: correction of unsafe working conditions, creation of safe-

ty consciousness, and study of accident reports in order to prevent recurrences.

In order to cover these points we have started a series of accident-prevention drives. Each drive period will be for fourteen weeks. During the first two weeks special emphasis will be placed upon cleaning up the mines and shops, repairing tracks and timber, installing guard rails, grizzlies and ladders. During this clean-up drive all men will be urged to clean up all chips and debris after a job is finished, and to maintain "good housekeeping" at all times.

Following the clean-up period there will be two weeks of intensive effort against injuries from falling ground and rocks. During these two weeks there will be daily safety posters giving warning about various types of falling ground injuries. Men will be urged by the bosses to set stulls with good headboards, use stringers, etc., and to bar down thoroughly at all times. A special effort will be made to have a sufficient supply of timber available at all places.

The third two-week period will be devoted especially to proper methods of blasting to avoid breaking walls and unnecessarily loosening ground.

The fourth two-week period will specialize on proper setting of timber stringers, safety stulls, etc. The fifth two-week period will be a campaign against injuries from handling cars, trucks and motors. The sixth period will be devoted to prevention of falls of persons; and the seventh, to prevention of injuries in handling machines and material.

While the drive specializes on one particular subject for each of the two-week periods, attention to all of the other causes will not be neglected. A daily report of all injuries—regardless of their severity—will be made, and records kept. In each case of serious injury a complete investigation and report will be made for the purpose of learning how to prevent a recurrence, and cumulative records of injuries will be kept day by day.

Throughout the drives all men will be expected to seek out accident hazards, and call the attention of the Boss and Safety Engineers to these hazards. Men will be urged at the Safety bulletin boards each morning to acquaint themselves with the progress of the drive and with the daily posters illustrating safety rules and practices.

In this drive the elimination of accident hazards is given a place of first importance but it is also recognized that each and every employee, whether he be a supervisor or worker, must do his share by being conscious of the inherent hazards of mining, and at all times exercise due care and caution.

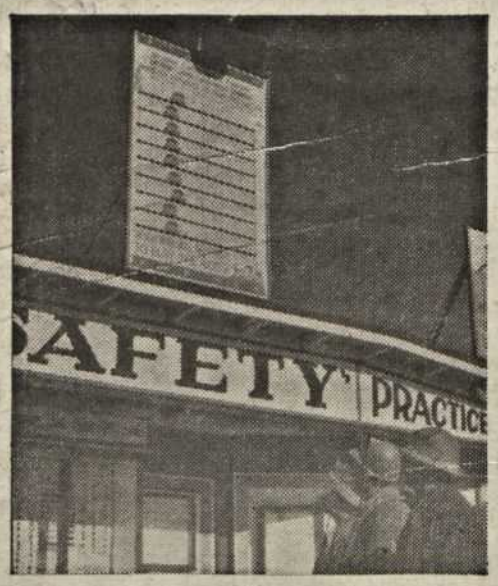
It is very interesting to note that the Butte mines accident rate of 3.12 injuries per 10,000 shifts for the month of November was the lowest total lost-time accident rate ever attained for a full operating month. In November there were no fatalities and the serious injury rate was also the lowest we have had for any month in the past six years.

Stringers advanced ahead of timber in a stope

Safety zone where miners get into clear to allow train to pass

An example of safety stulls with good head boards

Drop the Ore on The Axis!



IT'S a race to see which mine will be the first to bury the Axis. Last month the Badger came thumping through with a percentage of 120 and was therefore the first to dump its load of ore on the heads of Hitler, Mussolini and Hirohito.

Each mine in Butte has a production quota and the mine which leads in reaching or surpassing its quota each month gets the prize. On these Monthly Progress of War Production Bulletin Boards, established by the Victory Labor-Management Production Committee at Butte, each mine is represented by an ore car. Cars move along according to tonnages registered, and the car which gets there first dumps its load down the shaft.

Up at the Badger the boys feel pretty good, as they should, because they surpassed their quota by twenty per cent. The Belmont was close behind with 99 per cent and the Mountain Con came in third with 97 per cent.

We show here a close-up of the Production Board at the Badger (in the big picture at the top) just as the Badger car crossed the finishing line last month. You can see that the Belmont is close behind and the Mountain Con just a whisker behind the Belmont. While we were at it we got a picture of some of the boys at the Badger looking at the Board (the small picture at the upper left) and another one of a few of the boys at the Mountain Con looking at their Board early this month when the January race had just been going a short time.

These Production Boards are the combined creation of your representatives on the Victory Labor-Management Production Committee. Labor and management representatives prepared these Boards so that each miner might know how his mine stood in competition with other mines. Remember, each mine has an established quota, and it is the mine which does the best job in relation to its quota which wins the monthly award. Thus a smaller mine does not have to produce as much ore as a larger one—the quota of each mine is determined by its estimated yield.

Let's all of us, labor and management alike, keep an eye on these Boards. They are the barometers that tell us which mine is doing the best job in helping to lick the Axis.